



# UNITED STATES PATENT AND TRADEMARK OFFICE

*ew*

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/836,630	04/17/2001	Seiichi Izumi	282635US8X	7212
22850	7590	05/02/2007		
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER HYUN, SOON D	
			ART UNIT 2616	PAPER NUMBER
			NOTIFICATION DATE 05/02/2007	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com  
oblonpat@oblon.com  
jgardner@oblon.com

## Office Action Summary

Application No.

09/836,630

Applicant(s)

IZUMI, SEIICHI

Examiner

Soon D. Hyun

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 and 23-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 23-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. The indicated allowability of claims 1-17 is withdrawn in view of the newly discovered reference(s) to Greenstein et al (U.S. patent No. 6,1341,016). Rejections based on the newly cited reference(s) follow.

### ***Claim Objections***

2. Claim 1, 7, and 17 are objected to because of the following informalities: In claim 1, line 6, "the" before "phases" should be deleted to avoid lack of antecedent basis.

In claim 1, line 9, "the phases" should be changed to -- a phase --.

In claim 1, line 10, "the" before "phase" should be changed to -- a --.

In claim 4, line 3, "the" before "phase" should be deleted.

In claim 7, lines 4 and 5, respectively, "the" before "phase" should be changed to -- a --.

In claim 17, lines 3 and 4, respectively, "the" before "phase" should be changed to -- a --.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2616

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-14, 16, and 18-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Greenstein et al (U.S. Patent No. 6,131,016).

Regarding claims 1, 2, 6, 7, 9, 16, 18, 19, and 23-30, Greenstein et al (Greenstein) discloses a base station with two antenna elements for transmission diversity for OFDM signals, comprising:

a plurality of antenna elements (15 and 16 in FIG. 2);

a plurality of processing devices (FIG. 2) respectively connected to one of the antenna elements, and

Greenstein teaches that a wireless terminal compares a phase of a pilot tone (a frequency subcarrier) transmitted by one antenna (antenna 15) with a phase of pilot tone transmitted by another antenna (antenna 16) (col. 3, lines 4-11 and col. 5, lines 8-11) and sends feedback information to the base station to adjust phases of signals transmitted by the antenna elements according to the result of the comparison.

Greenstein further teaches that the comparison process performed by the terminal could be performed at the base station (col. 4, lines 13-19).

In a such case, the base station compares a phase of a pilot tone (a frequency subcarrier) received by one antenna (antenna 15) with a phase of pilot tone received transmitted by another antenna (antenna 16) and the base station adjusts phases of signals transmitted by the antenna elements according to the result of the comparison.

Regarding claims 4, 5, 11, and 12, Greenstein further discloses performing differential phase detection of successive received pilot tones, i.e., means for frequency adjusting phase differences of the subcarriers received respectively at one antenna element (col. 5, lines 8-10) and quantizing phase into K uniformly spaced values, i.e., averaging the phase differences (col. 5, lines 11-13).

Regarding claims 3 and 10, Greenstein further discloses amplitude adjustment depending on subcarrier phase comparison (col. 5, lines 25-37).

Regarding claim 8, Greenstein further discloses that quantizing about relative phases of the two channels into K uniformly spaced values, i.e., comparing is repeated at least twice to calculate an average value used for the step of adjusting.

Regarding claim 13, refer to the discussion for claim 7. Greenstein discloses comparing only predetermined subcarriers (pilot tones) of different antenna elements.

Regarding claim 14, Greenstein further discloses quantizing about relative phases of the two channels into K uniformly spaced values (col. 5, lines 11-13), i.e., correlating time domain data.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Greenstein et al (U.S. Patent No. 6,131,016) in view of Takai et al (U.S. Patent No. 5,561,673).

Regarding claim 15, refer to the discussion for claim 7. Greenstein further teaches that an antenna element carrying stronger signals is selected for further transmission, but Greenstein does not explicitly teach that one antenna is not used if a signal with amplitude below a predetermined threshold is received from the antenna element.

Takai et al (Takai) teaches a method of antenna switched diversity based on a threshold as recited in claim (col. 2, lines 3-7).

It would have been obvious to one having ordinary skill in the art to incorporate the method of Takai into Greenstein to use antenna elements efficiently.

7. Claims 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Greenstein et al (U.S. Patent No. 6,131,016).

Regarding claim 17, refer to the discussion for claim 1, however, Greenstein does not explicitly teach that the method is executed by software.


It would have been obvious to one having ordinary skill in the art to incorporate software to perform a method to take advantage of using the software (programmable).

**Conclusion**

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Soon D. Hyun whose telephone number is 571-272-3121. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi H. Pham can be reached on 571-272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
S. Hyun  
4/27/2007

  
CHI PHAM  
SUPERVISORY PATENT EXAMINER

4/27/07